JACOB'S PLAZA (PWS # 4200094)

SOURCE WATER ASSESSMENT REPORT

June 15, 2006

State of Idaho
Department of Environmental Quality

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Executive Summary

The Environmental Protection Agency (EPA), under the Safe Drinking Water Act Amendments of 1996, is requiring the State of Idaho to assess the potential susceptibility to contamination of all public water systems (PWS).

The primary objective of these source water assessments is to provide information that public water systems can use to develop and implement local Drinking Water Protection Plans. By evaluating land use within a 1,000 foot radius of the well, system construction, and existing hydrologic and geologic conditions, systems are scored *high*, *medium*, or *low* in terms of their susceptibility to contamination.

What Was Assessed

The Jacob's Plaza drinking water system (Figure 1) consists of one well. The system is located approximately 1 mile west of Mountain Home, Idaho, and serves approximately 25 people through 1 connection.

The assessment for your particular drinking water source is based on a land use inventory within a 1,000-foot radius of your drinking water source (Figure 2), sensitivity factors associated with the source, and characteristics associated with either your aquifer or watershed in which you live.

How Susceptibility Scores Were Determined

Well susceptibility was scored in three areas:

- Well system construction
- Contaminant inventory (type and amount) above the well's aquifer. Separate scores are given for each of four types of contaminants:
  - Inorganic contaminants (IOCs), such as nitrates and arsenic
  - Volatile organic contaminants (VOCs), such as petroleum products
  - Synthetic organic contaminants (SOCs), such as pesticides
  - Microbial contaminants, such as bacteria
- Hydrologic sensitivity, based on hydrologic and geologic conditions surrounding the well

Scores for This Assessment

The final scores are shown in Table 1.

Table 1. Susceptibility scores for Well.

	Susceptibility Scores[1]									
	Hydrologic Sensitivity	Contaminant Inventory				System Construction	Final Susceptibility Ranking			
Well		IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
Well #1	H	M	M	M	L	M	H*	H*	H*	H*

[1]H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility

H* = automatically high susceptibility rating due to Airbase Road existing within 50 feet of the wellhead (sanitary survey, 2001)

In terms of overall susceptibility, Well #1 rated automatically **high susceptibility** for IOCs, VOCs, SOCs, and microbial contaminants. The automatically high ratings are due to potential contaminants existing within 50 feet of the well, in this case Airbase Road. If not for the automatically high ratings, the system would have still rated moderate susceptibility for IOCs, VOCs, and microbial bacteria, and high susceptibility for SOCs. A well log was not available during this analysis, so well log information used in the scoring was given the most conservative score. If a well log had been available during this analysis, overall susceptibility ratings might have been lower. System construction

rated **moderate susceptibility** and hydrologic sensitivity rated **high susceptibility.** Land use rated **moderate susceptibility** for IOCs, VOCs, SOCs, and **low susceptibility** for microbial contaminants.

Summary of Laboratory Test Results for the System

Typically, transient systems only sample for the IOC nitrate and microbial bacteria. Tested water for this system did not detect any issues for these two constituents in well water.

How to Use These Results

This assessment is provided as information regarding JACOB'S PLAZA (PWS # 4200094)'s drinking water and should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source.

DEQ strongly encourages each PWS to use this assessment report to develop a *Source Water Protection Plan*, which is a community-derived and proactive strategy to protect drinking water. Protection plans can help avoid drinking water contamination and reduce expensive treatment/replacement costs.

Protection plans can also help educate the served community. Many people have an "out of sight, out of mind" mentality, but improper disposal of certain chemicals can cause health impacts. For instance, concentrations of some contaminants, as small as a few parts-per-billion, can be higher than allowable limits.

These results should not be used as an absolute measure of risk, nor should they be used to undermine public confidence in the water system. A particular rating DOES NOT imply that any regulatory or legal actions will occur.

Suggested Activities to Protect Your Drinking Water

Drinking water protection activities should first focus on correcting any deficiencies outlined in the *sanitary survey*. Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies, even though these strategies may not yield results in the near term.

System operators should do the following:

- Maintain a 50-foot radius (IDAPA 58.01.08.900.01) clear of all potential contaminants around the wellhead. If the pump house resides within this distance, it is important to keep the pump house clean and to not store disinfection chemicals or other chemicals there. The 50-foot buffer also reduces potential contamination related to chemical application or irrigation practices; the water system should restrict chemical application and irrigation activities near the wellhead.
- Identify and consider all possible sources of contamination not identified in this report, such as septic system effluent and document those sources to identify potential contaminant threats that could impact the Jacob's Plaza drinking water well.
- Correct any deficiencies included in the sanitary surveys—such as proper venting, drainage, and smooth nosed sample taps—as part of the water system's drinking water protection efforts.
- Carefully monitor and deal with any contaminant spills within the well's capture zone.
- Work with state and local agencies if the well's capture zone(s) are outside the direct jurisdiction of your PWS.
- Locate new wells in areas with as few potential sources of contamination as possible, and ensure that each new site is reserved and protected.

A strong public education program should also be a primary focus of any drinking water protection plan, as most well capture zones contain at least some urban and residential land uses. Public education topics could include:

- Proper lawn and garden care practices

- Household hazardous waste disposal methods
- Proper care and maintenance of septic systems
- The importance of water conservation

Resources and Assistance

There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the EPA. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the local Soil and Water Conservation District, and the Natural Resources Conservation Service.

For assistance in developing protection strategies, contact DEQ's Lewiston Regional Office or the Idaho Rural Water Association.

Lewiston Regional DEQ Office (208) 799-4370

State DEQ Office (208) 373-0502

Website: http://www.deq.idaho.gov/

Water suppliers serving fewer than 10,000 persons may contact Melinda Harper (mlharper@idahoruralwater.com), Idaho Rural Water Association, at 1-208-343-7001 for assistance with drinking water protection (formerly wellhead protection) strategies.

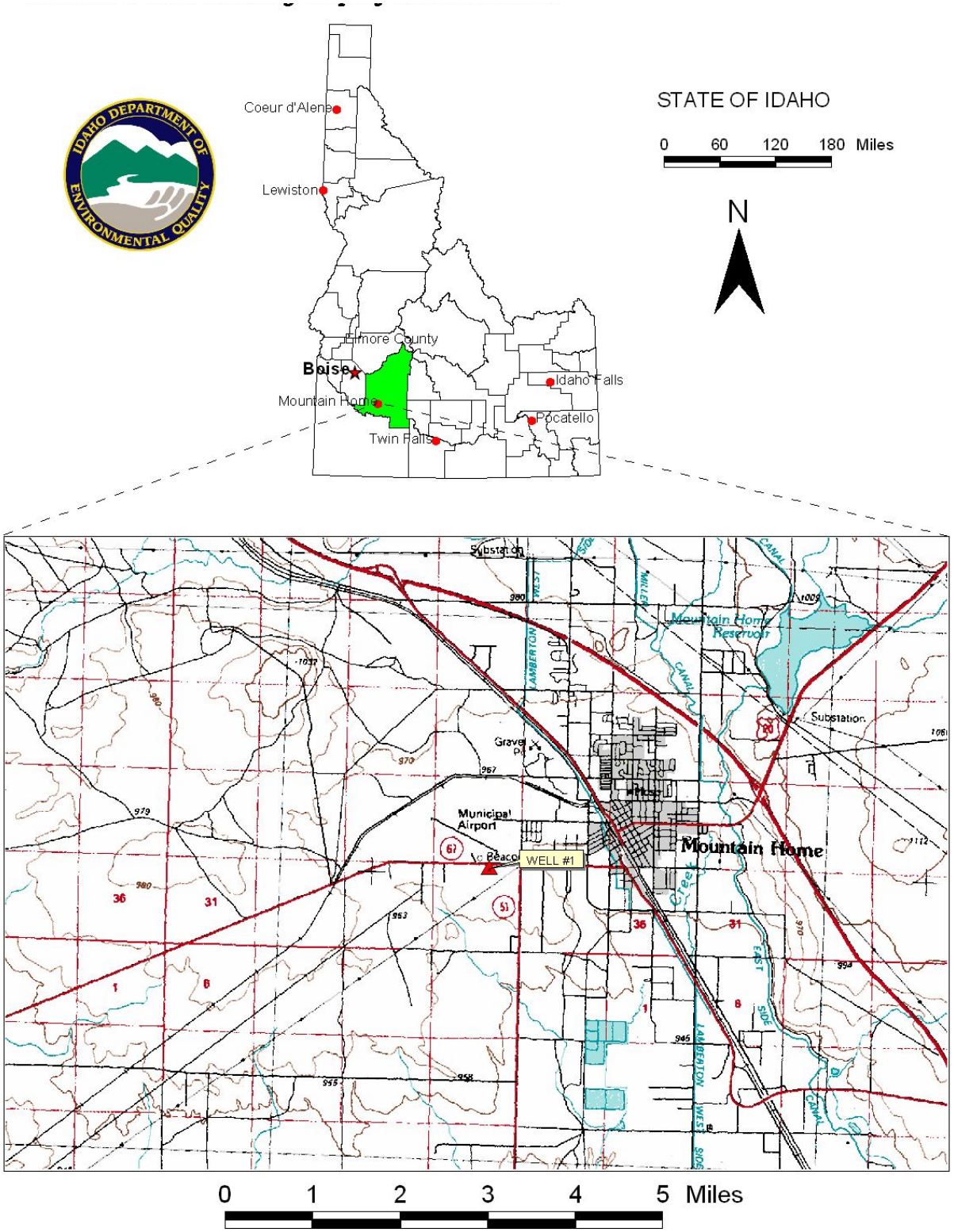

Figure 1. Site vicinity map of Jacob's Plaza, Well #1.

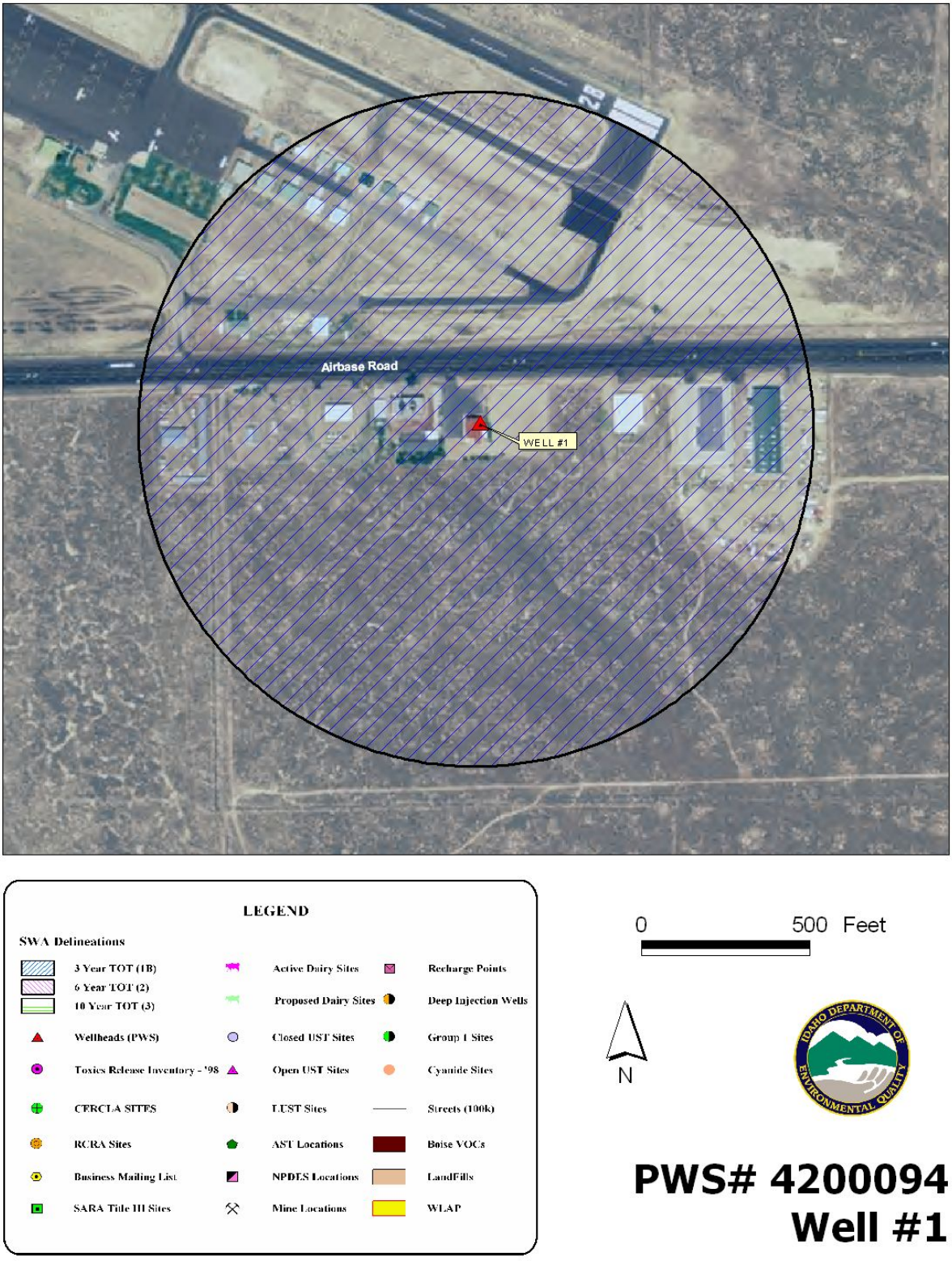

Figure 2. Jacob's Plaza delineation map and potential contaminant source locations.

Susceptibility Analysis: The Basis for Assessment

A water system's susceptibility to contamination is rated as *high*, *moderate*, or *low risk* according to the following considerations:

- hydrologic sensitivity
- system construction
- potential contaminant sources and land use

The susceptibility ratings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative rating that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. The following summaries describe the rationale for the susceptibility rating.

Hydrologic Sensitivity

The hydrologic sensitivity of a well is dependent upon four factors:

- Surface soil composition
- Material in the vadose zone (between the land surface and the water table)
- Depth to first ground water
- Presence of an *aquitard* (a 50-foot thick fine-grained zone above the producing zone of the well).

Slowly draining soils such as silt and clay typically are more protective of ground water than coarse-grained soils, such as sand and gravel. Similarly, fine-grained sediments in the subsurface and a water depth of more than 300 feet protect the ground water from contamination.

The hydrologic sensitivity rated **high susceptibility** for Well #1. Regional soil data indicates the presence of moderately- to well-drained soils surrounding the well bore. A well log was not available during this analysis, so it is unknown if an aquitard is present above the well's producing zone, if the vadose is composed of predominantly of permeable materials, or if the water table is more than 300 feet below ground surface (bgs).

System Construction

System construction directly affects the ability of the well to protect the aquifer from contaminants. System construction scores are low when information shows that potential contaminants will have a more difficult time reaching the intake of the well. Lower scores imply a system is less vulnerable to contamination.

For example, if the well casing and annular seal both extend into a low permeability unit, then the possibility of contamination is reduced, and the system construction score goes down. If the highest production zone is more than 100 feet below the water table, then the system is considered to have better buffering capacity. If the wellhead and surface seal are maintained to standards, as outlined in sanitary surveys, then contamination down the well bore is less likely. If the well is protected from surface flooding and is outside the 100-year floodplain, then contamination from surface events is reduced.

The system construction scores rated **moderate susceptibility** for well #1. According to the National Resource Conservation Service (NRCS), the well is located outside of a 100-year floodplain, and the 2001 sanitary survey did not indicate any deficiencies with the wellhead and surface seal. Because a well

log was not available, it is unknown if the casing and annular seal extend into low-permeability units, or if the well's highest production zone comes from more than 100 feet below the static water levels.

Current PWS well construction standards can be more stringent than when a well(s) was constructed. The Idaho Department of Water Resources *Well Construction Standards Rules* (1993) require all PWSs to follow DEQ standards as well. IDAPA 58.01.08.550 requires that PWSs follow the *Recommended Standards for Water Works* (1997) during construction. Some of the regulations deal with screening requirements, aquifer pump tests, use of a down-turned casing vent, and thickness of casing. Table 1 of the *Recommended Standards for Water Works* (1997) lists the required steel casing thickness for various diameter wells.

Regulations for steel pipe thickness based on size of pipe

Size of pipe (inches)	Thickness (inches)
≤6	0.280
8	0.322
10	0.365
12-20	0.375

Well tests are required at the design pumping rate for 24 hours or until stabilized drawdown has continued for at least six hours when pumping at 1.5 times the design pumping rate.

Because the well's construction does not meet all current standards, the well was assessed an additional system construction point.

Potential Contaminant Sources and Land Use

An IOC detection above a drinking water limit, any detection of a VOC or SOC, or a detection of total coliform bacteria or fecal coliform bacteria at the wellhead will automatically give a high final susceptibility rating to a well, despite the land use of the area, because a pathway for contamination already exists. Additionally, having potential contaminant sources within 50 feet of the wellhead will give an automatic high final susceptibility rating.

If an automatic high rating is not received, final susceptibility ratings are derived by equally weighting hydrologic sensitivity and system construction scores. Potential contaminant sources in the 0- to 3-year time-of-travel zone (Zone 1B) also contribute greatly to the overall rating.

Based on the initial computer generated contaminant source inventory conducted by DEQ, there are two potential contaminant sources located within the 1,000-foot boundary. This information has been summarized and included in Table 2. A copy of the susceptibility analysis worksheet for your system, along with a map showing any potential contaminant sources, is included with this summary.

Land use for the well rated **moderate susceptibility** for IOCs (e.g., arsenic, nitrate), VOCs (e.g., petroleum products), SOCs (e.g., pesticides), and **low susceptibility** for microbial contaminants (e.g., bacteria). The small number of potential contaminant sources (Table 1), and the lack of urbanization and agricultural activity contributed to the scores.

Table 2. Jacob's Plaza, potential contaminant inventory.

SITE #	Source Description[1]	Source of Information	Potential Contaminants[2]
	Municipal Airport	MAP	VOC, SOC
	Equipment Storage	MAP	IOC, VOC, SOC
	Airbase Road	MAP	IOC, VOC, SOC, Microbials

[2]IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Options for Drinking Water Protection

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

For JACOB'S PLAZA (PWS # 4200094), drinking water protection activities should focus on ensuring compliance with the 2001 sanitary survey and minimizing spills or releases associated with the transportation corridors and potential contaminant sources within the designated source water area.

Partnerships with state and local agencies and industry groups should be established as they are critical to success. Establishing a dialog with the relevant state and local agencies related to the local roads also recommended.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any drinking water protection plan. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the EPA. For areas where transportation corridors transect the delineation (Figure 2), the Idaho Department of Transportation should be included in protection activities. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the local Soil Conservation District, and the Natural Resources Conservation Service.

POTENTIAL CONTAMINANT INVENTORY
LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as ASuperfund≅ is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (IDEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.)

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by IDEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.

The final scores for the susceptibility analysis were determined using the following formulas:

1. VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.273)
2. Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.35)

Final Susceptibility Scoring:

0 - 5 Low Susceptibility
6 - 12 Moderate Susceptibility
≥ 13 High Susceptibility

Ground Water Susceptibility Report Public Water System Name: JACOB'S PLAZA Well#: WELL #1

Public Water System Number 4200094

1. System Construction		SCORE			
Drill Date	UNK				
Driller Log Available?	NO				
Sanitary Survey (if yes, indicate date of last survey)?	YES	2001			
Well meets IDWR construction standards?	UNK	1			
Wellhead and surface seal maintained?	YES	0			
Casing and annular seal extend to low permeability unit?	UNK	2			
Highest production 100 feet below static water level?	UNK	1			
Well located outside the 100 year flood plain?	YES	0			
Total System Construction Score		4 (M)			
2. Hydrologic Sensitivity					
Soils are poorly to moderately drained?	NO	2			
Vadose zone composed of gravel, fractured rock or unknown?	UNK	1			
Depth to first water > 300 feet?	UNK	1			
Aquitard present with > 50 feet cumulative thickness?	UNK	2			
Total Hydrologic Score		6 (H)			
3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	UNDEVELOPED	0	0	0	0
Farm chemical use high	YES	2	0	2	
IOC, VOC, SOC, or Microbial sources in Zone 1A	YES	YES	YES	YES	YES
Total Potential Contaminant Source/Land Use Score - Zone 1A		2	0	2	0
Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	YES	2	3	3	1
(Score = # Sources X 2) 8 Points Maximum		4	6	6	2
Sources of Class II or III leacheable contaminants or	YES	2	3	3	
4 Points Maximum		2	3	3	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B	Less Than 25% Agricultural Land	0	0	0	0
Total Potential Contaminant Source / Land Use Score - Zone 1B		6	9	9	2
Cumulative Potential Contaminant / Land Use Score		8 (M)	9 (M)	11 (M)	4 (L)
4. Final Susceptibility Source Score		12(M)	12(M)	13(H)	11(M)
5. Final Well Ranking		Auto-high	Auto-high	Auto-high	Auto-high